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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,098	10/31/2003	Masahiro Tadauchi	040301-0639	9009

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EXAMINER

ZIMMERMAN, JOHN J

ART UNIT PAPER NUMBER

1775

DATE MAILED: 06/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/697,098

Applicant(s)

TADAUCHI ET AL.

Examiner

John J. Zimmerman

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/5/06 (RCE papers).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,8-11,13-16 and 18-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,8-11,13-16 and 18-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

THIRD OFFICE ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 5, 2006 has been entered.

Amendments

2. As instructed by applicant in the request for continued examination filed June 5, 2006, the AMENDMENT AND REPLY UNDER 37 CFR 1.116 received May 4, 2006 has been entered and considered. Claims 1, 3-6, 8-11, 13-16 and 18-22 are pending in this application.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1775

4. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. There is no antecedent basis in claim 21 for "the core part" (e.g. see line 5).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 21 is rejected under 35 U.S.C. 102(b) as being anticipated by Shimizu (JP Publication 2001-121285).

8. Shimizu discloses a lead-free joining material comprising zinc and tin as major components and further containing 1 wt.% Ge (e.g. see example 9 in Table 1; paragraph [0007]). There is no reason for one of ordinary skill in the art to believe that the concentration of the Ge would be different in the "core part" than the rest of the solder alloy of Shimizu.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 3-6, 8-11, 13-16 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadauchi (Japanese publication 2002-283093).

11. Tadauchi '093 discloses a lead-free joining material comprising a tin alloy containing between 3-12 wt.% zinc and further containing 1-3 wt.% bismuth (e.g. see paragraphs [0010], [0015]-[0016]; Figure 1). The particles are made by solidifying droplets of the molten alloy composition (e.g. see paragraph [0023]). The solidified spherical particles of this composition result in concentration zones of alloy constituents (e.g. see paragraph [0025]; Figure 3). The particles are mixed with a flux and a solder paste is created (e.g. see paragraph [0026]) and applied to a substrate and reflowed (e.g. see paragraph [0028]). Tadauchi '093 may differ from the pending claims in that Tadauchi '093 may not describe the surface layer as having a depth of 2 μm , may not describe the concentration of bismuth in the solid-solution phase in a range of 0.6 to 4.0 wt.% and may not describe a needle crystal dispersed in the solid-solution phase including zinc as a main component. Although Tadauchi '093 does not describe these features of the particles, one of ordinary skill in the art would reasonably expect that these features would be present in the particles of Tadauchi '093. A review of applicant's disclosure shows that the

Art Unit: 1775

surface layer, concentration of bismuth and the needle crystals are a result of using the composition of Tadauchi '093 when solidifying the tin-zinc-bismuth alloy into particles. The applicant's specification does not disclose that any particular cooling rate is necessary or critical to achieve the claimed invention nor do the pending method recitations require any particular critical cooling rate in the production of the claimed microstructure. Since Tadauchi's cooling rate is at least sufficient to reproduce core and surface layer concentration zones of alloy constituents, barring evidence to the contrary, one of ordinary skill in the art would reasonably expect the process of Tadauchi to also produce the additionally recited microstructure of claimed particles. Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977). The fact that applicant has closely observed the tin-zinc alloy particles and described their microstructure in more detail than Tadauchi '093, does not differentiate the claimed subject matter from the particles of Tadauchi '093. Discovery of a new property or use of previously known composition, even if unobvious from the prior art, cannot impart patentability to claims to known composition, *In re Spada*, 15 USPQ2d 1655 (Court of Appeals, Federal Circuit 1990). Regarding the overlapping ranges of the alloying constituents, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the

Art Unit: 1775

invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 USPQ 549.

Response to Arguments

12. Applicant's arguments filed May 4, 2006 have been fully considered but they are not persuasive.

13. Regarding the rejection of claim 21 under 35 U.S.C. 102(b) as being anticipated by Shimizu (JP Publication 2001-121285), Shimizu discloses a lead-free joining material comprising zinc and tin as major components and further containing 1 wt.% Ge (e.g. see example 9 in Table 1; paragraph [0007]). There is no reason for one of ordinary skill in the art to believe that the concentration of the Ge would be different in the "core part" than the rest of the solder alloy of Shimizu.

14. Regarding the rejection of claims 1, 3-6, 8-11, 13-16 and 18-22 under 35 U.S.C. 103(a) as being unpatentable over Tadauchi (Japanese publication 2002-283093), applicant argues that Tadauchi's process is not substantially identical to applicant's process and therefore the product produced by Tadauchi's process would not be the same as the product produced by applicant's process. Applicant points to the use of a cooling bath filled with oil to solidify the droplets of Tadauchi verses the use of solidification in an inert gas atmosphere in the description of the process in applicant's pending application. Applicant argues that the "cooling bath of mineral oil

Art Unit: 1775

would provide a certain microstructure upon solidification of particles due to the cooling rate that is provided by the mineral oil. This cooling rate would be different than that disclosed by way of example in Applicant's specification and would result in a different microstructure". Applicant's arguments on this issue have been carefully considered, but appear to be speculative. The applicant's specification does not disclose that any particular cooling rate is necessary to achieve the claimed invention nor do the pending method claims require any particular cooling rate in the production of the claimed microstructure. Since Tadauchi's cooling rate is at least sufficient to reproduce core and surface layer concentration zones of alloy constituents, barring evidence to the contrary, one of ordinary skill in the art would reasonably expect the microstructure of claimed particles would also have been reproduced by Tadauchi. Applicant's speculation that the cooling rate would be different enough that Tadauchi would produce a microstructure outside that of the claimed limitations is not supported by evidence. Merely speculating that Tadauchi may produce a different product than that required by the pending claims is not sufficient to outweigh the expectation that Tadauchi's invention would be identical or substantially identical to that claimed by applicant. There is no evidence of record that cooling particles in mineral oil would result in a cooling rate that is insufficient to provide the claimed microstructure. In addition, if cooling in an inert gas atmosphere is indeed *critical* to formation of the claimed microstructure and if cooling at a particular cooling rate is indeed *critical* to the formation of the claimed microstructure, then in the very least, the pending method claims should recite these critical limitations. Claims omitting features critical or essential to the practice of the invention are not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Regarding applicant's argument that composition ranges of Tadauchi are not

Art Unit: 1775

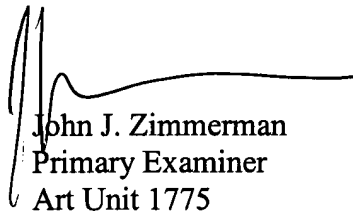
commensurate with the claimed composition ranges, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 USPQ 549.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 1775



John J. Zimmerman
Primary Examiner
Art Unit 1775

jjz
June 14, 2006